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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/558,887	12/02/2005	Junichi Kuratomi	G12-195095C/KK	6130
21254 7590 04/03/2008 MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC 8321 OLD COURTHOUSE ROAD SUITE 200 VIENNA, VA 22182-3817				
EXAMINER ARCIERO, ADAM A				
ART UNIT		PAPER NUMBER		
1795				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/558,887

Applicant(s)

KURATOMI ET AL.

Examiner

ADAM A. ARCIERO

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04/05/2007.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
4a) Of the above claim(s) 19 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-18 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 02 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date 12/02/2005
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

Election/Restrictions

1. Newly submitted claim 19 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the method for fabricating a nonaqueous electrolyte battery can be made in a materially different method. For example, a nonaqueous electrolyte battery as the one in claim 1 can be produced without the performing of an initial charge/discharge to form a lithium ion-permeable protective film on a surface of the negative electrode. **Furthermore, the method of making the battery is classified in Class 29/623.1 and the battery is classified in Class 429/231.1.**

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 19 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Response to Amendment

The Amendment filed June 13, 2007 has been entered and fully considered. Claims 1-19 remain pending in the application. Claims 9-19 are newly presented. Claim 19 is withdrawn as being drawn to a non-elected invention. The 35 USC 102(b) rejections of claims 1-8 in the previous office action are withdrawn in light of Applicant's amendments to the claims. Claims 1-8 have been amended. Claims 1-18 are finally rejected for reasons given below that are necessitated by applicant's amendment to the claims.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 11 recite the limitation “wherein said cyclic organic compound having no carbon-carbon pi bond...” in lines 1 and 2 of claim 11. There is insufficient antecedent basis for this limitation in the claim. Claim 1 recites the limitation of the cyclic organic compound having a carbon-carbon pi bond.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over SHIOZAKI et al. (JP 2003-007298) in view of YAMAGUCHI et al. (Pub. No. US 2002/0037458 A1).

As to Claims 1-18, SHIOZAKI et al. discloses a positive electrode active material having an α -NaFeO₂-type crystal structure represented by the formula Li_xMn_aNi_bCo_cO₂ (where $0.3 \leq a \leq 0.5$, $0.36 \leq b \leq 0.55$, $0 \leq c \leq 0.34$, $0.95 \leq x/(a+b+c) \leq 1.05$) (Abstract and Claim 1). Example 1 discloses the formula Li₁Mn_{0.33}Ni_{0.33}Co_{0.33}O₂ for the positive electrode active material (paragraphs [0068] and [0069]). The subscripts for the chemical composition of the prior art fall within or overlap the subscript ranges as claimed by the Applicant in both claims 1, 2 and 12. In claim 2, d can be zero. Vinylene carbonate is used as the cyclic carbonate having a carbon-carbon π bond (paragraph [0031]). The negative electrode is comprised of graphite (paragraph [0038]). Also, it is possible to add metallic oxides such as boron, amorphous carbon, etc., to graphite (paragraph [0039]). The negative electrode material comprising graphite may also comprise a combination of graphite with a lithium metal or a lithium alloy (paragraph [0038]). The non-aqueous electrolyte uses a mixture of an inorganic lithium salt and an organic lithium salt having a perfluoroalkyl group (paragraph [0031]). The non-aqueous electrolyte is comprised of LiPF₆ or LiBF₄ as an inorganic lithium salt (paragraph [0032]). The non-aqueous electrolyte is comprised of LiN(CF₃SO₂)₂ or (LiN(C₂F₅SO₂)₂) as an organic lithium salt having a perfluoroalkyl group (paragraph [0032]). The nonaqueous electrolyte can further comprise a nonaqueous solvent including at least one cyclic organic compound having no carbon-carbon π bond, wherein the cyclic organic compound having no carbon-carbon π bond is at least one selected from propylene carbonate, ethylene

carbonate and butylene carbonate (paragraph [0031]). The lithium secondary battery comprises a positive electrode containing a positive active material (paragraph [0017]) and is produced by applying the electrolyte mixture to a charge collector (paragraph [0037]), a negative electrode (anode) containing an active material, a conducting material and a binder, formed on a charge collector (paragraph [0023]), and a separator is formed between said positive and negative electrodes (paragraph [0029]). SHIOZAKI et al. does not expressly disclose the cyclic carbonate having a carbon-carbon π bond of claims 1 and 2 being in an amount which is not greater than 20% by weight of said nonaqueous electrolyte or that the cyclic carbonate having a carbon-carbon π bond is vinylene carbonate used with a cyclic carbonate having no π bond in the amount claimed.

YAMAGUCHI et al. teaches a nonaqueous electrolyte secondary lithium battery wherein the nonaqueous electrolyte comprises a composition including vinylene carbonate preferably in the amount of 0.05 wt% to 20 wt% (pg. 5, [0066]) to enable operation of the battery at low temperature without deterioration of performance (pg. 5, [0062]). The cathode active material can be a lithium transition metal oxide (pg. 2, [0019]) and the anode active material can be graphite (pg. 3, [0043]). An antioxidant is also added to the electrolyte to prevent the decomposition of the vinylene carbonate or other nonaqueous solvents by the oxygen radicals (pg. 4, [0055]). YAMAGUCHI specifically teaches using the composition of the electrolyte solution comprising EC, PC, DMC and VC in the weight ratio 10:27:5:55:3 and further, the BHT was added to the electrolyte solution at the rate of 30 ppm (pg. 10, [0171]).

At the time of the invention, a person having ordinary skill in the art would have been motivated to use an electrolyte solution comprising EC (ethylene carbonate), PC (propylene carbonate), DMC (dimethyl carbonate) and VC (vinylene carbonate) in the weight ratio 10:27:5:55:3 and further adding BHT to the electrolyte solution at the rate of 30 ppm (pg. 10, [0171]).in a lithium battery so as to enhance the cycle characteristics of the battery without deteriorating the capacity of said battery at low environmental temperature without degradation of the electrolyte solvent, as suggested by YAMAGUCHI et al. (paragraphs [0055], [0062], [0066]).

The nonaqueous electrolyte lithium battery of SHIOZAKI modified by YAMAGUCHI et al. has the same active material and amount of vinylene carbonate in the electrolyte as claimed, wherein the nonaqueous electrolyte containing a cyclic carbonate having a carbon-carbon π bond is used. It is inherent in the battery of SHIOZAKI modified by YAMAGUCHI that a lithium ion-permeable protective coated film is formed on the surface of the negative electrode and it is also inherent that after an 84 day high temperature storage test, an increase in thickness of the battery is no greater than about 8%. The protective film comprising a decomposition product of vinylene carbonate and having a density and lithium ion permeability which are dependent upon reaction between said nonaqueous electrolyte and said composite oxide is inherently formed in the nonaqueous battery of SHIOZAKI modified by YAMAGUCHI et al. The protective film inherently restrains the decomposition of the other nonaqueous solvents used within the electrolyte, and gas generation caused by swelling can be restrained, improving battery performance.

The court has held that claiming of a property or characteristic which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See also MPEP 2112 and 2112.01. When the Examiner has provided a sound basis for believing that the products of the applicant and the prior art are the same, the burden of proof is shifted to the applicant to prove that the product shown in the prior art does not possess the characteristics of the claimed product. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

8. Claims 1-15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over IWAKOSHI et al. (JP 08-213015) in view of YAMAGUCHI et al. (Pub. No. US 2002/0037458 A1).

As to Claims 1-15 and 17, IWAKOSHI et al. discloses a positive electrode active material having an α -NaFeO₂-type crystal structure represented by the formula $\text{Li}_x\text{M}_c\text{Ni}_b\text{Co}_b\text{O}_2$ (where $0.01 \leq a \leq 0.99$, $0.01 \leq b \leq 0.99$, $0.01 \leq c \leq 0.3$, $0.8 \leq (a+b+c) \leq 1.2$). M is at least one element selected from the group comprising Al, V, Mn, Fe, Cu and Zn (Abstract and Claim 1). The value of subscript "x" is $0.8 \leq x \leq 1.2$ (paragraph [0011]). The subscripts for the chemical composition of the prior art fall within or overlap the subscript ranges as claimed by the Applicant in both claims 1, 2 and 12, as d=0. Vinylene carbonate is used as the cyclic carbonate having a carbon-carbon π bond (paragraph [0020]). The negative electrode is comprised of graphite (paragraph [0019]). The non-aqueous electrolyte uses a mixture of an inorganic lithium salt and an organic lithium salt having a perfluoroalkyl group (paragraph [0021]). The non-aqueous

electrolyte is comprised of LiPF_6 or LiBF_4 as an inorganic lithium salt (paragraph [0021]). The non-aqueous electrolyte is comprised of $\text{LiN}(\text{CF}_3\text{SO}_2)_2$ as an organic lithium salt having a perfluoroalkyl group (paragraph [0021]). The non-aqueous electrolyte can comprise a mixture of both vinylene carbonate, as described above, and a cyclic organic compound having no carbon-carbon π bond such as ethylene carbonate, propylene carbonate and butylene carbonate (paragraph [0020]). The negative electrode of a lithium secondary battery comprises a combination of a graphite with a lithium compound such as a lithium metal or lithium alloy (paragraph [0019]).

IWAKOSHI et al. does not expressly disclose the cyclic carbonate having a carbon-carbon π bond of claims 1 and 2 being in an amount which is not greater than 20% by weight of said nonaqueous electrolyte or that the cyclic carbonate having a carbon-carbon pi bond is vinylene carbonate used with a cyclic carbonate having no pi bond in the amount claimed.

YAMAGUCHI et al. teaches a nonaqueous electrolyte secondary lithium battery wherein the nonaqueous electrolyte comprises a composition including vinylene carbonate preferably in the amount of 0.05 wt% to 20 wt% (pg. 5, [0066]) to enable operation of the battery at low temperature without deterioration of performance (pg. 5, [0062]). The cathode active material can be a lithium transition metal oxide (pg. 2, [0019]) and the anode active material can be graphite (pg. 3, [0043]). An antioxidant is also added to the electrolyte to prevent the decomposition of the vinylene carbonate or other nonaqueous solvents by the oxygen radicals (pg. 4, [0055]). YAMAGUCHI specifically teaches using the composition of the electrolyte solution comprising EC, PC, DMC and VC in

the weight ratio 10:27:5:55:3 and further, the BHT was added to the electrolyte solution at the rate of 30 ppm (pg. 10, [0171]).

At the time of the invention, a person having ordinary skill in the art would have been motivated to use an electrolyte solution comprising EC (ethylene carbonate), PC (propylene carbonate), DMC (dimethyl carbonate) and VC (vinylene carbonate) in the weight ratio 10:27:5:55:3 and further adding BHT to the electrolyte solution at the rate of 30 ppm (pg. 10, [0171]). in a lithium battery so as to enhance the cycle characteristics of the battery without deteriorating the capacity of said battery at low environmental temperature without degradation of the electrolyte solvent, as suggested by YAMAGUCHI et al. (paragraphs [0055], [0062], [0066]).

The nonaqueous electrolyte lithium battery of IWAKOSHI et al. modified by YAMAGUCHI et al. has the same active material and amount of vinylene carbonate in the electrolyte as claimed, wherein the nonaqueous electrolyte containing a cyclic carbonate having a carbon-carbon pi bond is used. It is inherent in the battery of IWAKOSHI et al. modified by YAMAGUCHI et al. that a lithium ion-permeable protective coated film is formed on the surface of the negative electrode and it is also inherent that after an 84 day high temperature storage test, an increase in thickness of the battery is no greater than about 8%. The protective film comprising a decomposition product of vinylene carbonate and having a density and lithium ion permeability which are dependent upon reaction between said nonaqueous electrolyte and said composite oxide is inherently formed in the nonaqueous battery of IWAKOSHI et al. modified by YAMAGUCHI et al. The protective film inherently restrains the decomposition of the

other nonaqueous solvents used within the electrolyte, and gas generation caused by swelling can be restrained, improving battery performance.

The court has held that claiming of a property or characteristic which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See also MPEP 2112 and 2112.01. When the Examiner has provided a sound basis for believing that the products of the applicant and the prior art are the same, the burden of proof is shifted to the applicant to prove that the product shown in the prior art does not possess the characteristics of the claimed product. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Response to Arguments

9. Applicant's arguments with respect to claims 1-8 have been considered but are moot in view of the new ground(s) of rejection. The new grounds of rejection were necessitated by applicant's amendment to the claims.

11. Applicant's arguments filed 06/13/2007 have been fully considered but they are not persuasive. The Applicant argues on page 9 of the remarks that the positive active material of IWAKOSHI et al. disclosed in the description in paragraph [0031] gives an $|a-b| = 0.6$. The Examiner respectfully does not agree. IWAKOSHI et al. discloses a positive electrode active material having an α -NaFeO₂-type crystal structure represented by the formula $\text{Li}_x\text{M}_c\text{Ni}_a\text{Co}_b\text{O}_2$ (where $0.01 \leq a \leq 0.99$, $0.01 \leq b \leq 0.99$, $0.01 \leq c \leq 0.3$, $0.8 \leq (a+b+c) \leq 1.2$). M is at least one element selected from the group comprising Al, V, Mn, Fe, Cu and Zn (Abstract and Claim 1). The value of subscript "x" is $0.8 \leq x \leq 1.2$ (paragraph [0011]). Here, IWAKOSHI et al.'s

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subscripts of “c” and “a” correspond to applicant’s claimed subscripts of “a” and “b” respectively. The endpoints of “c” and “a” being 0.01 and 0.01, respectively, clearly fall within the Applicant’s claimed range of $|a-b| \leq 0.05$ as it would give $|a-b| = 0$ ($|c-a| = 0$ using the subscripts of IWAKOSHI et al.).

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adam A. Arciero whose telephone number is 571-270-5116. The examiner can normally be reached on Monday through Thursday, 7:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AA

/Susy N Tsang-Foster/

Supervisory Patent Examiner, Art Unit 1795